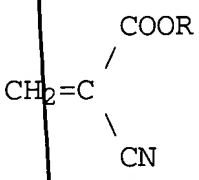
applying the adhesive material to the leadframe or to the die;

placing the die on the leadframe with the adhesive material in contact with the die and the leadframe to form an adhesive layer therebetween; and

curing the adhesive material at the temperature and at the ambient atmosphere in less than about 60 seconds to bond the die to the leadframe.

2. (twice amended) The method of claim 1 wherein the [cyanoacrylate] adhesive material comprises a monomer with a formula:



wherein R comprises a hydrocarbon group.

3. (twice amended) The method of claim 1 further comprising applying a catalyst to the leadframe, to the die, or to the adhesive material to [initiate] accelerate the curing step.

4. (twice amended) The method of claim 1 wherein the leadframe comprises a lead-on-chip leadframe and the filler is selected to increase a dielectric strength of the adhesive layer.

5. (twice amended) The method of claim 1 further comprising providing the filler is selected to improve a thermal conductivity, a mechanical strength, an electrical conductivity, a dielectric strength, a moisture resistivity, or a thermostability of the adhesive material in the package. [leadframe with condensed ambient humidity and initiating the curing step using the humidity.]

6. (twice amended) A method for [attaching] packaging a semiconductor die to [a leadframe] form a semiconductor package comprising:

providing [the] a leadframe;

[and the die with condensed ambient humidity;]

providing a cyanoacrylate adhesive material formulated to cure in less than about 60 seconds at a temperature of about 20°C to 30°C and at an ambient atmosphere;

providing a filler in the adhesive material selected to improve a thermal conductivity, a mechanical strength, an electrical conductivity, a dielectric strength, a moisture resistivity, or a thermostability of the adhesive material in the package;

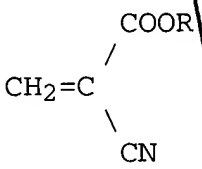
applying the [cyanoacrylate] adhesive material to the leadframe or to the die;

placing the die on the leadframe with the adhesive material compressed between the die and the leadframe to form an adhesive layer therebetween; and

curing the adhesive layer at the temperature and the ambient atmosphere in less than about 60 seconds.

[by interaction of the adhesive material with the humidity to bond the die to the leadframe.]

7. (twice amended) The method of claim 6 wherein the [cyanoacrylate] adhesive material comprises a monomer with a formula:



wherein R comprises a hydrocarbon group.

8. (twice amended) The method of claim 6 wherein the applying step [comprises] is performed using a method

selected from the group consisting of syringe dispensing, stenciling, dip coating, spraying, and dot shooting.

9. (twice amended) The method of claim 6 wherein the applying step [comprises] is performed by forming a plurality of dots of the adhesive material on the leadframe.

10. (twice amended) The method of claim 6 [further comprising providing the adhesive material with a] wherein the filler [comprising] comprises a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni.

11. (twice amended) The method of claim 6 further comprising applying a catalyst to the leadframe, to the die, or to the adhesive material to [initiate] accelerate the curing step.
[, the catalyst comprising a compound selected from the group consisting of water and acid.]

12. (twice amended) A method for [attaching] packaging a semiconductor die to [a leadframe] form a semiconductor package, comprising:

providing [the] a leadframe [with] comprising a plurality of lead fingers; [configured to form a die mounting area;]

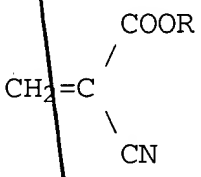
applying an adhesive material on the lead fingers or on the die, the adhesive material comprising a cyanoacrylate adhesive formulated to cure in less than about 60 seconds at a temperature of about 20°C to 30°C and at an ambient atmosphere, and an electrically insulating filler configured to increase a dielectric strength of the adhesive material to inhibit cross talk between the lead fingers in the package;

placing the die on the lead fingers with the adhesive material in contact with the die and the lead fingers to form an adhesive layer therebetween; and

curing the adhesive layer at the temperature and the ambient atmosphere in less than about 60 seconds to bond the die to the lead fingers.

13. (twice amended) The method of claim 12 further comprising applying a catalyst to the lead fingers, to the die or to the adhesive material prior to the placing step, to accelerate the curing step.

14. (twice amended) The method of claim 12 wherein the [cyanoacrylate] adhesive material comprises a monomer with a formula:

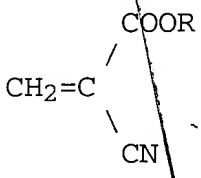


wherein R comprises a hydrocarbon group.

15. (twice amended) A method for [attaching] packaging a semiconductor die to [a leadframe] form a semiconductor package, comprising:

providing a leadframe;

providing an adhesive material comprising a cyanoacrylate monomer having a formula:



wherein R is a hydrocarbon group, the adhesive material formulated to cure in less than about 60 seconds at a temperature of about 20°C to 30°C and at an ambient atmosphere;

providing a filler in the adhesive material comprising a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni;

applying the adhesive material to the leadframe or to the die;

applying a catalyst to the leadframe or to the die;

placing the die on the leadframe with the adhesive material compressed between the die and the leadframe to form an adhesive layer therebetween; and

curing the adhesive layer at the temperature and the ambient atmosphere in less than about 60 seconds by interaction of the adhesive material with the catalyst to bond the die to the leadframe.

16. (twice amended) The method of claim 15 wherein the catalyst comprises water or acid.
[a compound selected from the group consisting of water and acid.]

17. (twice amended) The method of claim 15 further comprising selecting the filler to improve a characteristic of the adhesive layer in the package.
[providing the adhesive material with a filler comprising a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni.]

18. (twice amended) The method of claim 15 wherein the leadframe comprises a mounting paddle for [attaching] supporting the die in the package.

19. (twice amended) The method of claim 15 wherein the leadframe comprises a lead-on-chip leadframe comprising a plurality of lead fingers for [attaching] supporting the die in the package.

20. (twice amended) The method of claim 15 wherein the applying step [comprises] is performed using a method selected from the group consisting of syringe dispensing, stenciling, dip coating, spraying, and dot shooting.

21. (twice amended) A method for [attaching] packaging a semiconductor die to [a leadframe] form a semiconductor package comprising:

providing a leadframe;

providing an adhesive material comprising an anaerobic acrylic formulated to cure in less than about 60 seconds at a temperature of about 20°C to 30°C and at an ambient atmosphere;

providing a filler in the adhesive material comprising a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni;

applying the adhesive material to the leadframe or to the die;

placing the die on the leadframe with the adhesive material compressed between the die and the leadframe to form an adhesive layer therebetween; and

curing the adhesive layer at the temperature and the ambient atmosphere in less than about 60 seconds to bond the die to the leadframe.

22. (twice amended) The method of claim 21 further comprising initiating the curing step using ambient humidity on the leadframe or the die.

[providing the adhesive material with a filler comprising a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni.]

40. (amended) The method of claim 22 further comprising applying a catalyst to the leadframe, to the die, or to the adhesive material prior to [initiate] the curing step.

41. (amended) The method of claim 40 wherein the leadframe comprises a lead-on-chip leadframe comprising a plurality of lead fingers for supporting the die in the package.

42. (amended) A method for [attaching] packaging a semiconductor die to [a leadframe] form a semiconductor package, comprising:

providing a leadframe;

providing an adhesive material comprising an anaerobic acrylic formulated to cure in less than about 60 seconds at a temperature of about 20°C to 30°C and at an ambient atmosphere;

providing a filler in the adhesive material selected to improve a thermal conductivity, a mechanical strength, an electrical conductivity, a dielectric strength, a moisture resistivity, or a thermostability of the adhesive material in the package;

applying the adhesive material to the die or to the leadframe;

applying a catalyst to the leadframe or to the die;

placing the die on the leadframe with the adhesive material in contact with the die and the leadframe to form an adhesive layer therebetween; and

curing the adhesive material at the temperature and at the ambient atmosphere in less than about 60 seconds by interaction of the adhesive material with the catalyst to bond the die to the leadframe.

43. (amended) The method of claim 42 wherein the leadframe comprises a lead-on-chip leadframe comprising a plurality of lead fingers for supporting the die.

44. (amended) The method of claim 42 wherein the filler [further comprising adding a filler to the adhesive

material comprising] comprises a material selected from the group consisting of SiO_2, Al_2O_3, AlN, Ag, Ni, Fe, SiC, and polystyrene coated Ni.

REMARKS

Office Action

Claims 1-9, 11-16 and 18-20 have been rejected under 35 USC §103(a) over DiLeo et al. (US Patent No. 4,209,358) in view of either Mikuni et al. (US Patent No. 5,175,337) or Nishino et al. (US Patent No. 5,739,205).

Claims 10 and 17 have been rejected over DiLeo et al. (US Patent No. 4,209,358) in view of either Nishino et al. (US Patent No. 5,739,205) or Litke (US Patent No. 4,533,422).

Claims 1-9, 11-16 and 18-20 have been rejected under 35 USC §103(a) over DiLeo et al. (US Patent No. 4,209,358) in view of either Mikuni et al. (US Patent No. 5,175,337) or Nishino et al. (US Patent No. 5,739,205) and further in view of O'Sullivan (US Patent No. 3,832,334).

Claims 10 and 17 have been rejected over DiLeo et al. (US Patent No. 4,209,358) in view of either Nishino et al. (US Patent No. 5,739,205) or Litke (US Patent No. 4,533,422) and further in view of O'Sullivan (US Patent No. 3,832,334).

Claims 21 and 40-43 have been rejected under 35 USC §103(a) over DiLeo et al. (US Patent No. 4,209,358) in view of Burnett et al. (US Patent No. 2,628,178).

Claims 22 and 44 have been rejected under 35 USC §103(a) over DiLeo et al. (US Patent No. 4,209,358) in view of Burnett et al. (US Patent No. 2,628,178) and Gruber et al. (US Patent No. 3,987,019).

In response to the rejections, the claims have been amended. In addition, the Examiner is asked to consider the arguments to follow.